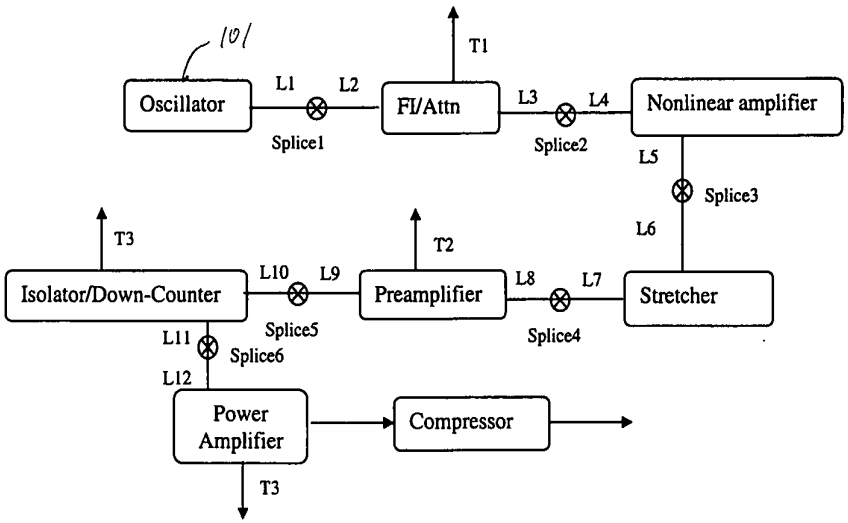
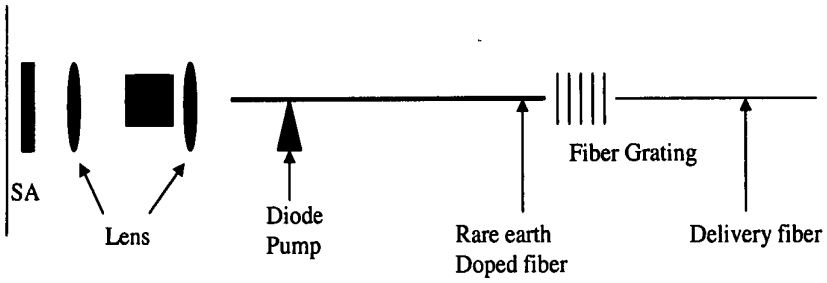


Figure 1 FCPA block diagram


SA
Lens
Diode
Pump
Rare earth
Doped fiber
Fiber Grating
Delivery fiber

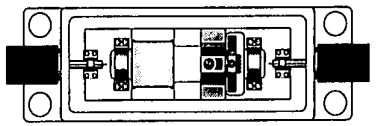


Fig. 1A

Fig. 1B

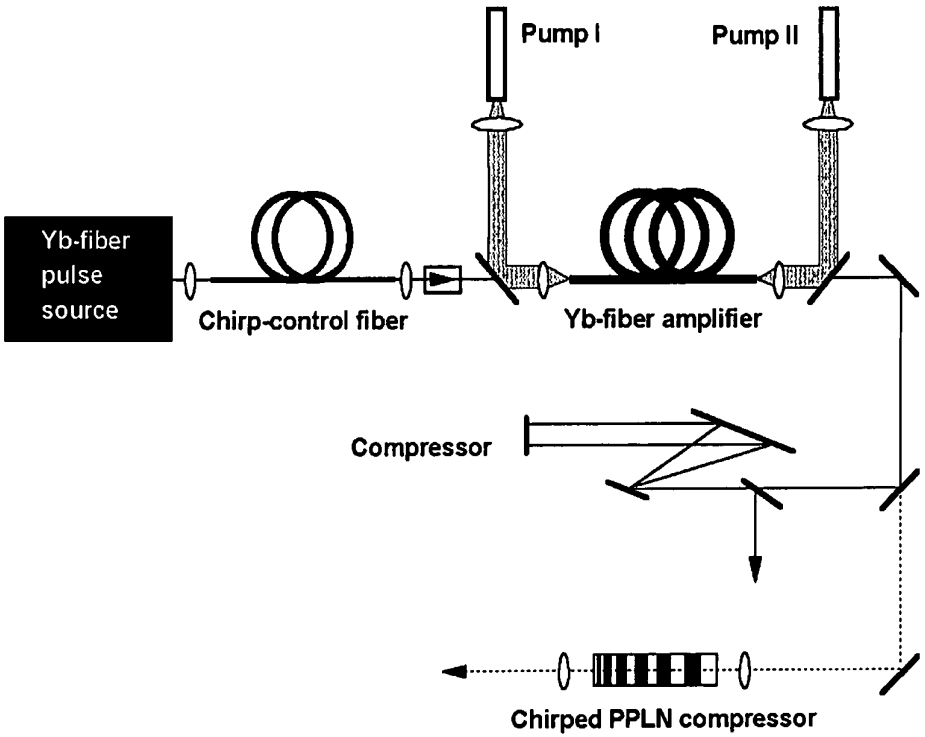

Pump I
Pump II
Yb-fiber pulse source
Chirp-control fiber
Yb-fiber amplifier
Compressor
Chirped PPLN compressor

Fig. 1B

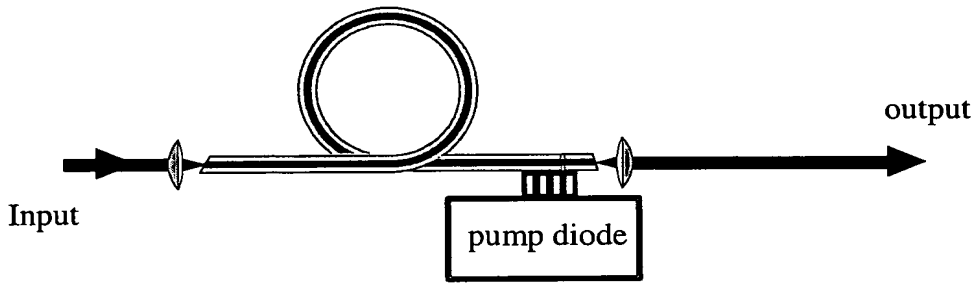
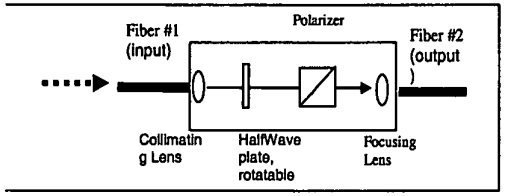
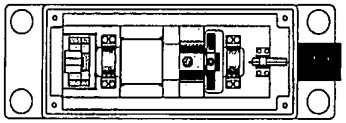


Fig. 1C

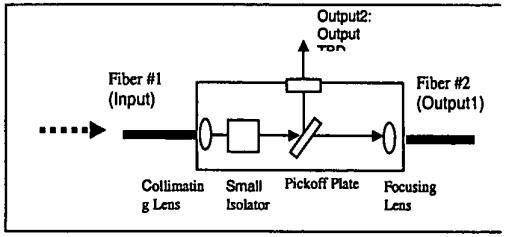
Figure 2 Outline Dimensions of two Typical Module Packages

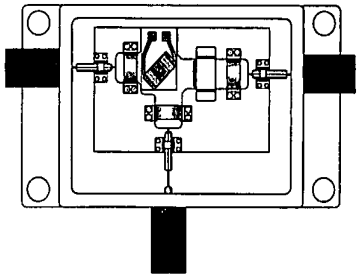
Attenuator Module





Pigtailed Tap Points





Attenuator Module package: length, width & height: 40.1mm x 12.7mm x 9.11mm

Pigtailed Tap Points package: length, width & height: 39.1mm x 22.7mm x 10.11mm

For comparison, the outline dimensions for a standard 14pin butterfly package : 30.0mm x 12.7mm

Fig. 3 Optical Layout for Down counter module

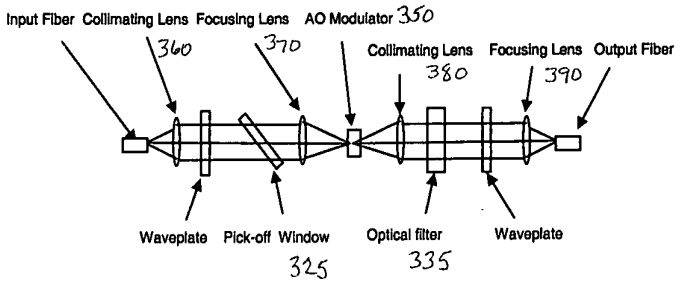
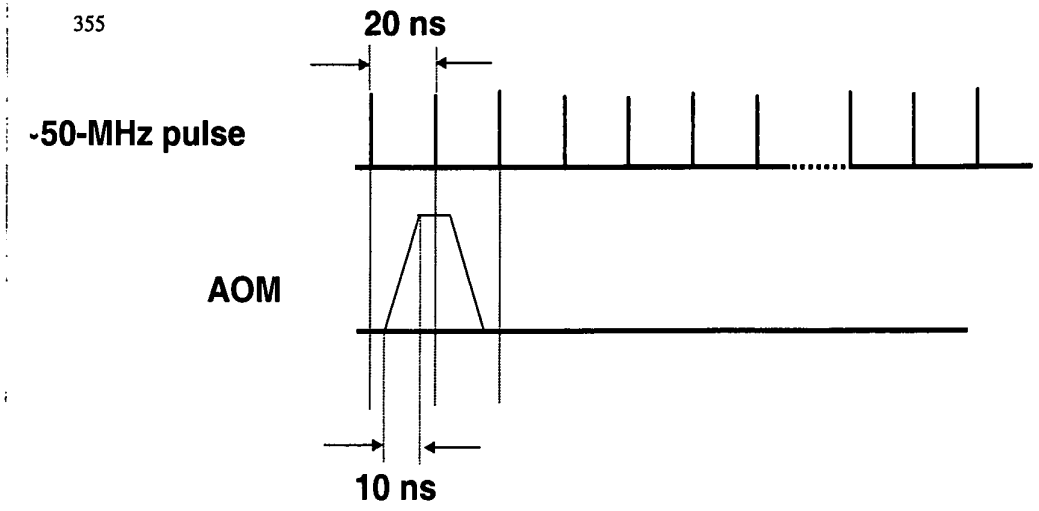


Fig. 4 Temporal performance of down counter



For 50-MHz pulse train, the rise time of 10 ns of AOM is desirable

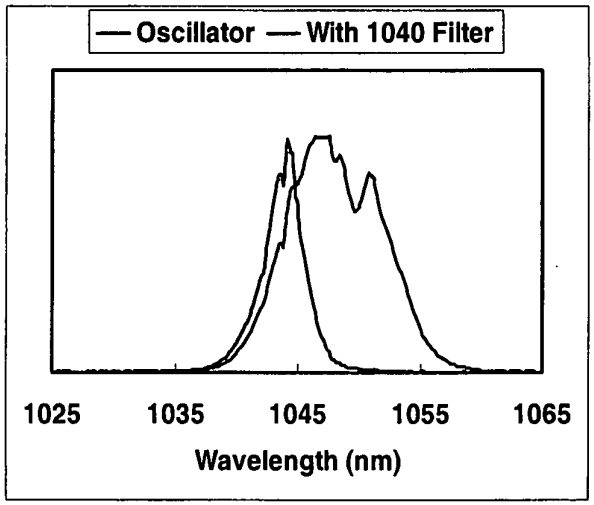
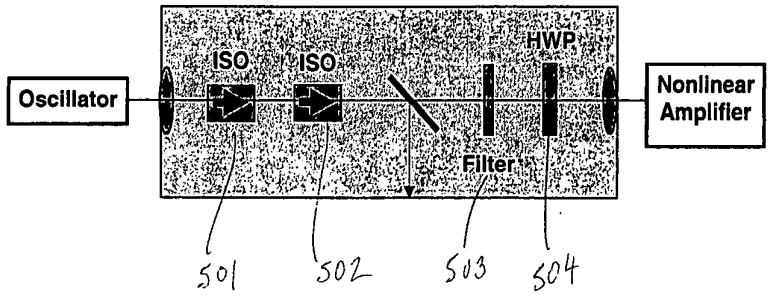
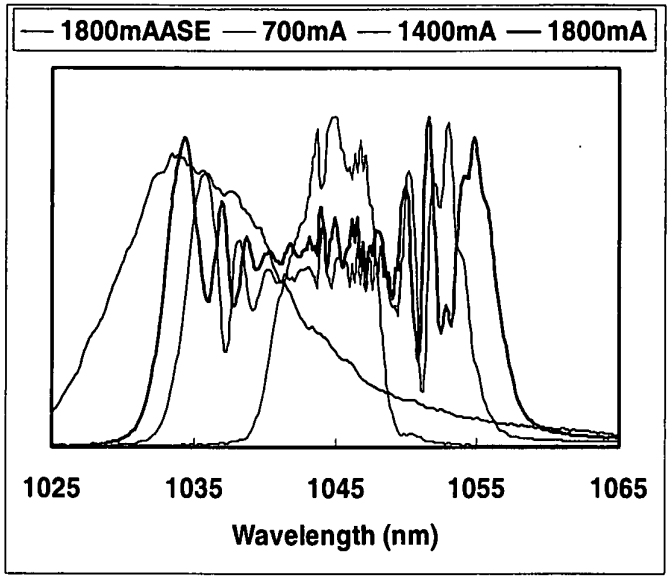


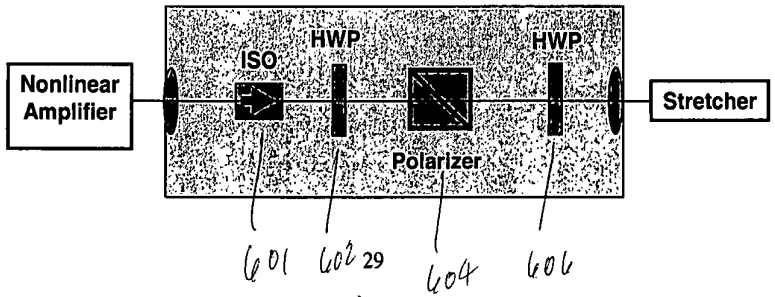
Fig. 5 (a) Spectrum from oscillator and after first filter, isolator and attenuator module. (b) Component illustration of filter, isolator and attenuator module.





360 **Fig. 6a Spectrum from nonlinear amplifier as a function of pump diode current and ASE spectraloutput at peak current. (b) Component illustration of isolator – attenuator module between nonlinear amplifier and stretcher.**

365



370 **Fig. 7 Spectrum of pulses with self-phase modulation propagating in a positive dispersion fiber.**

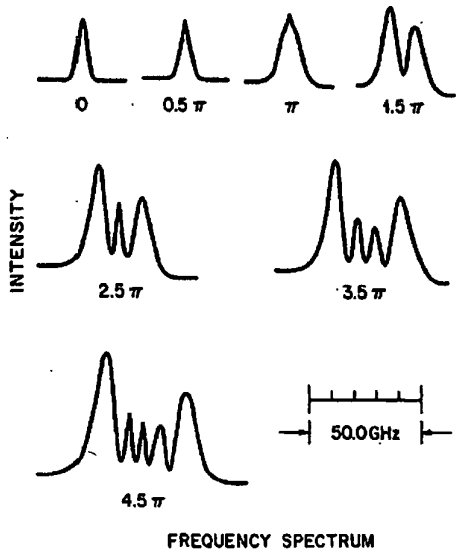
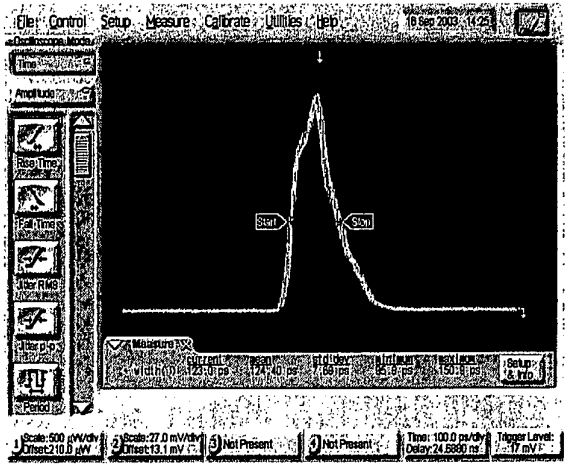
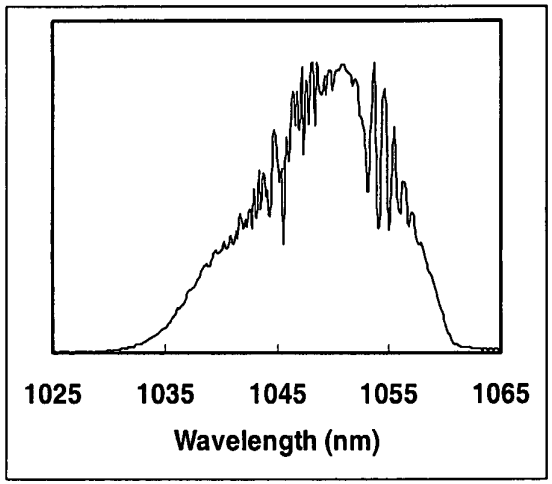


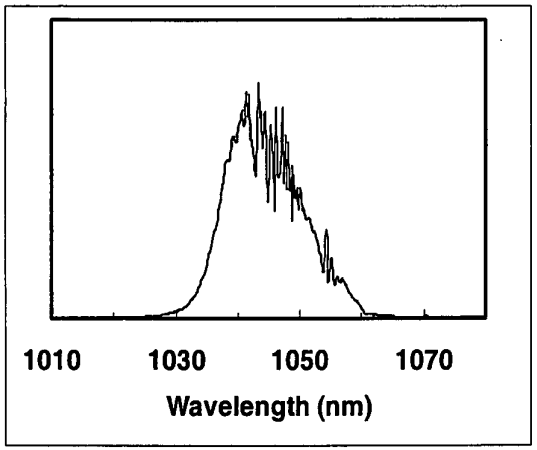
Fig. 4.3 Experimentally observed spectra for a nearly Gaussian pulse at the output of a 99-m-long fiber. Spectra are labeled by the maximum phase shift ϕ_{max} related linearly to the peak power (after Ref. 9).



375

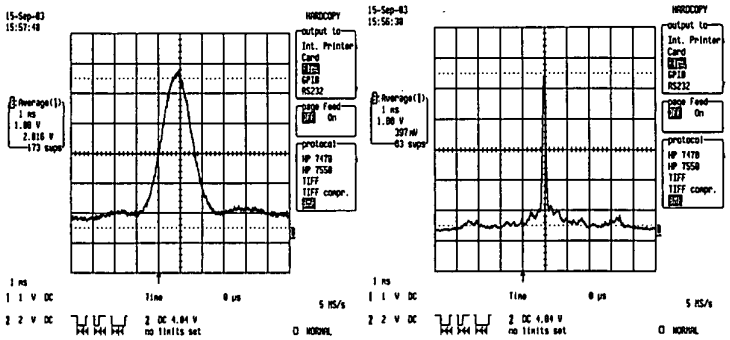
380 **Fig 8 Temporal (a) and spectral (b) profile of the pulse after stretcher**





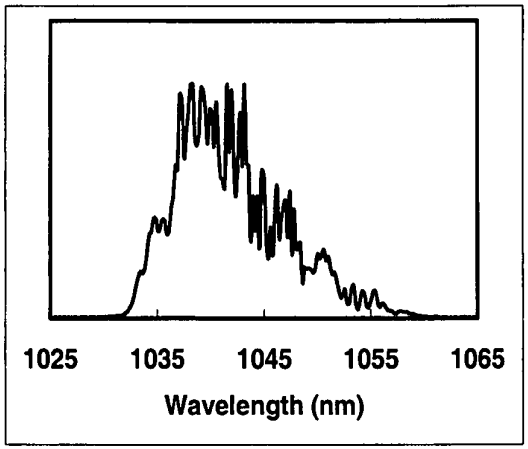
385

Fig. 9 - Spectrum after power amplifier



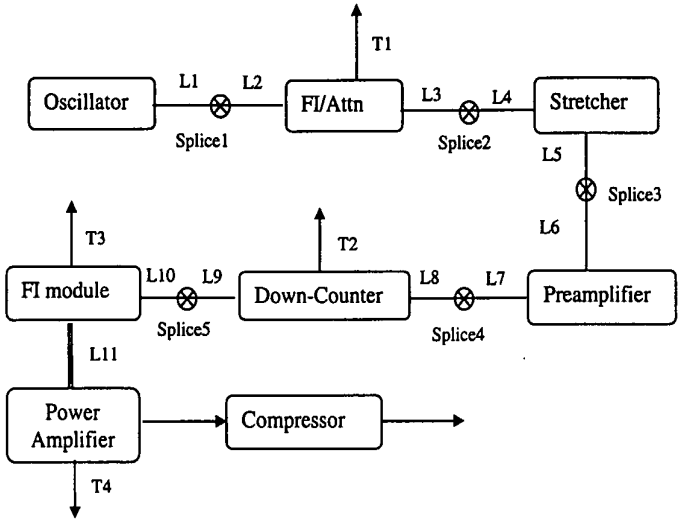
390

Figure 10 - Auto correlations of output pulse (a) 5 ps range (b) 50 ps range. (c) Spectrum of output



395

Figure 11 FCPA block diagram (second embodiment)



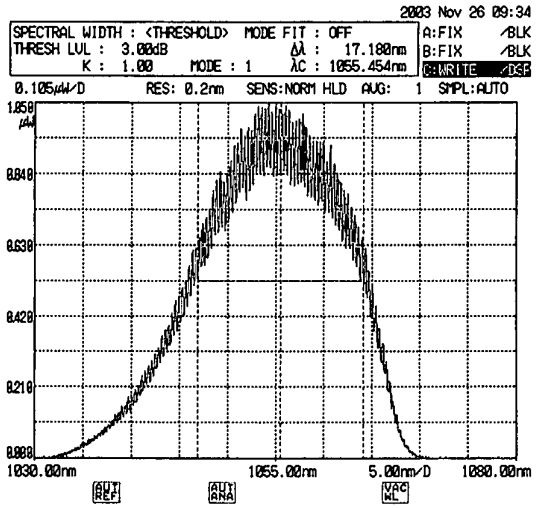
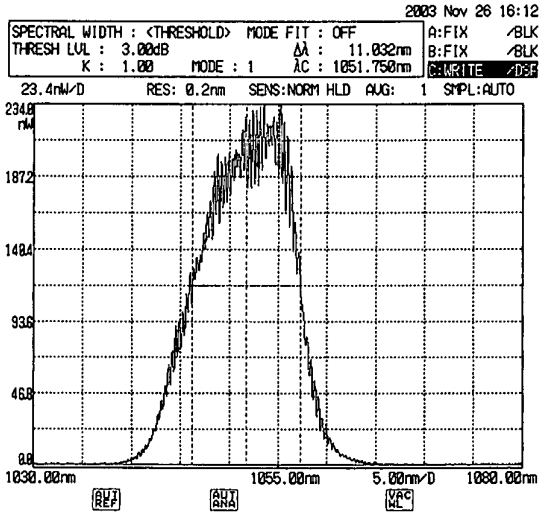


Figure 12 (a) Spectrum from oscillator (b) Spectrum after filter module.



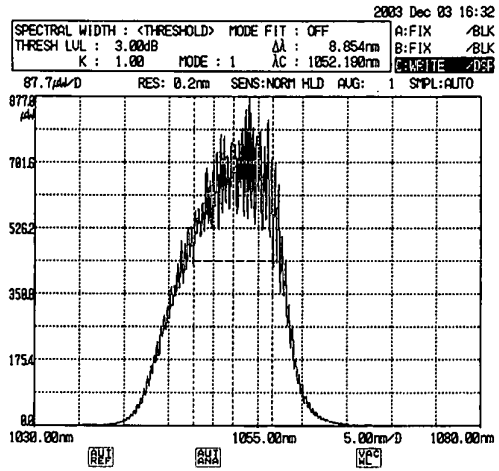
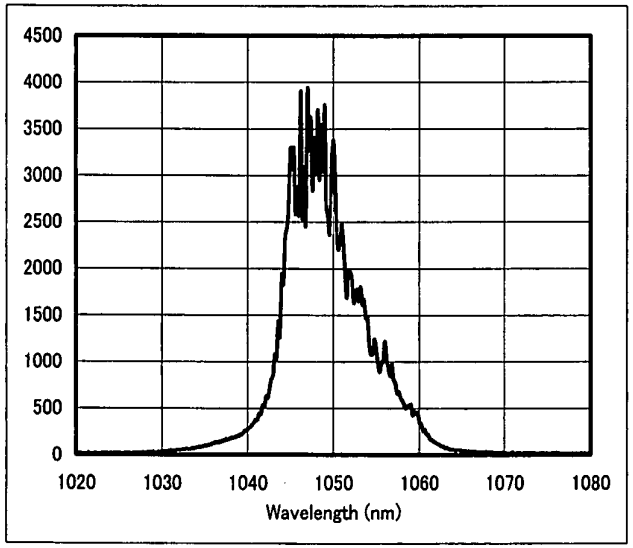


Figure 13 (a) spectrum after preamplifier (b) after power amplifier.

405



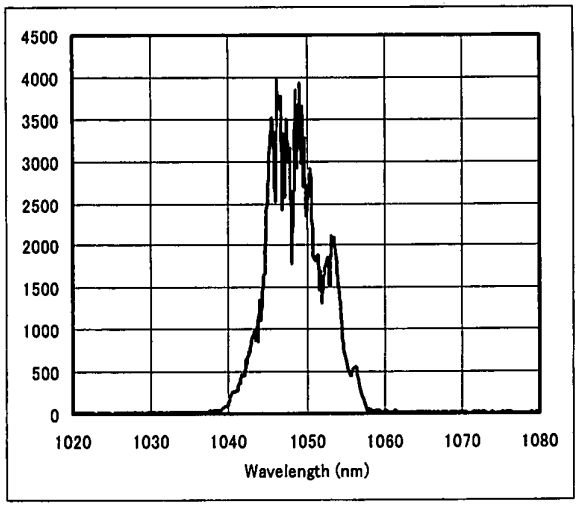
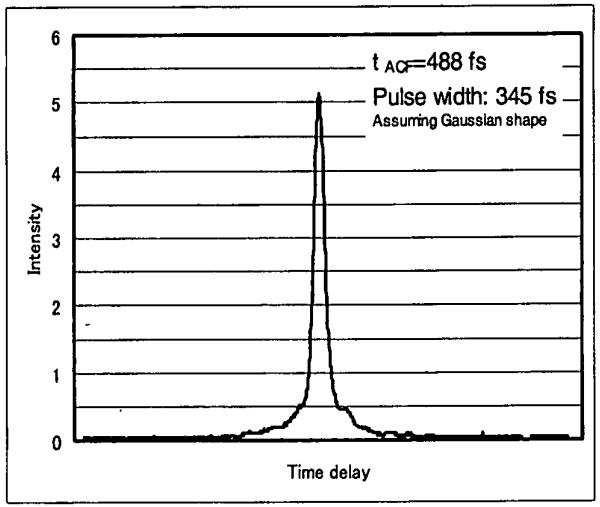


Figure 14(a) Spectrum after compressor and (b)

autocorrelation of compressed pulse.



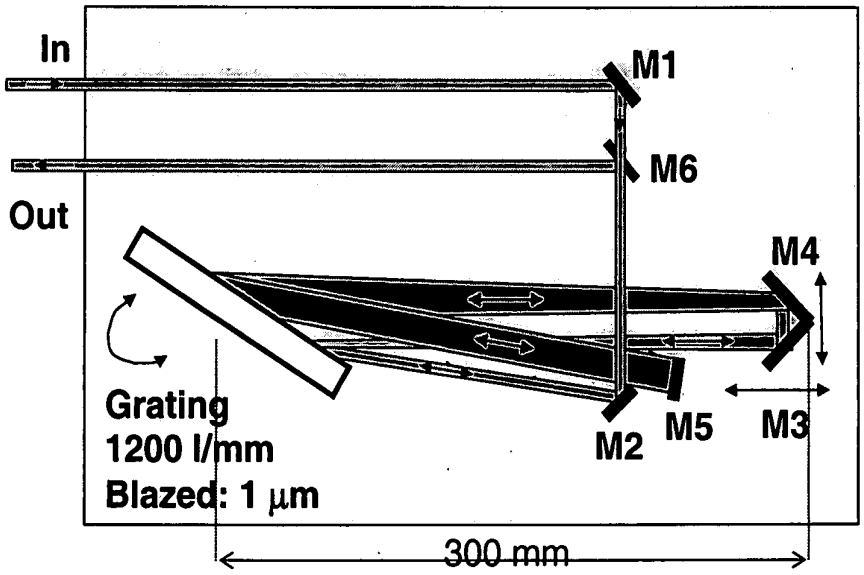


Fig. 14c

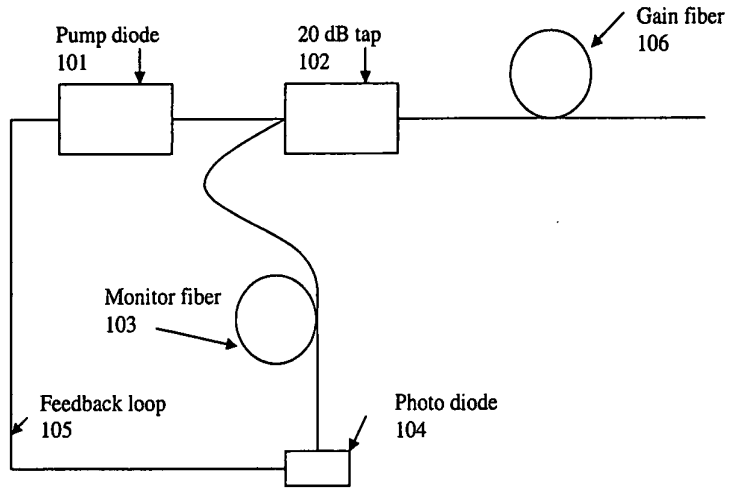

Pump diode
101
20 dB tap
102
Gain fiber
106
Monitor fiber
103
Feedback loop
105
Photo diode
104

Fig. 15

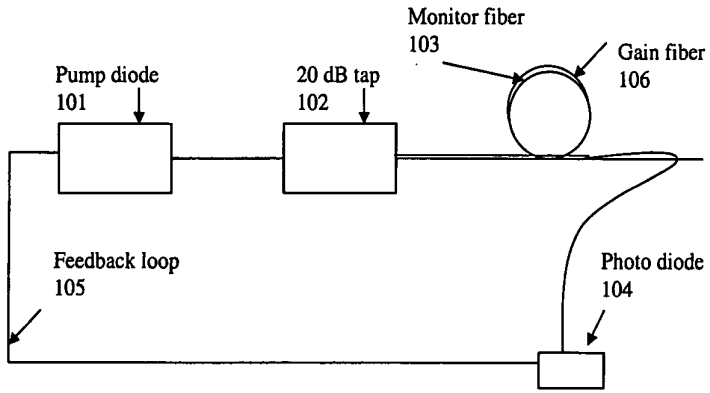

Monitor fiber
103
Gain fiber
106
Pump diode
101
20 dB tap
102
Feedback loop
105
Photo diode
104

Fig. 16

Fig 17 Acousto-optic Deflector Illustrating Dispersive Characteristic of Induced Bragg Grating

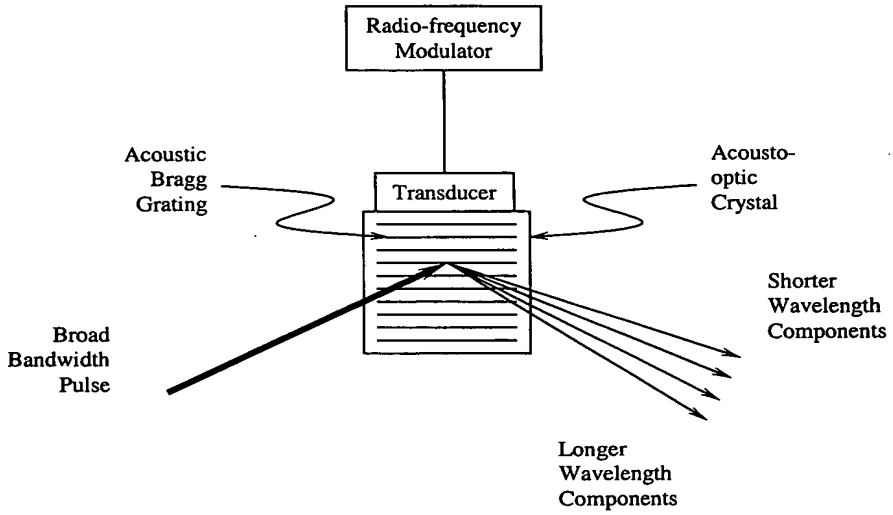


Fig. 18 - Rudimentary Two-pass Chirped-pulse Dispersion-compensated Acousto-optic Switch using Transmission Gratings

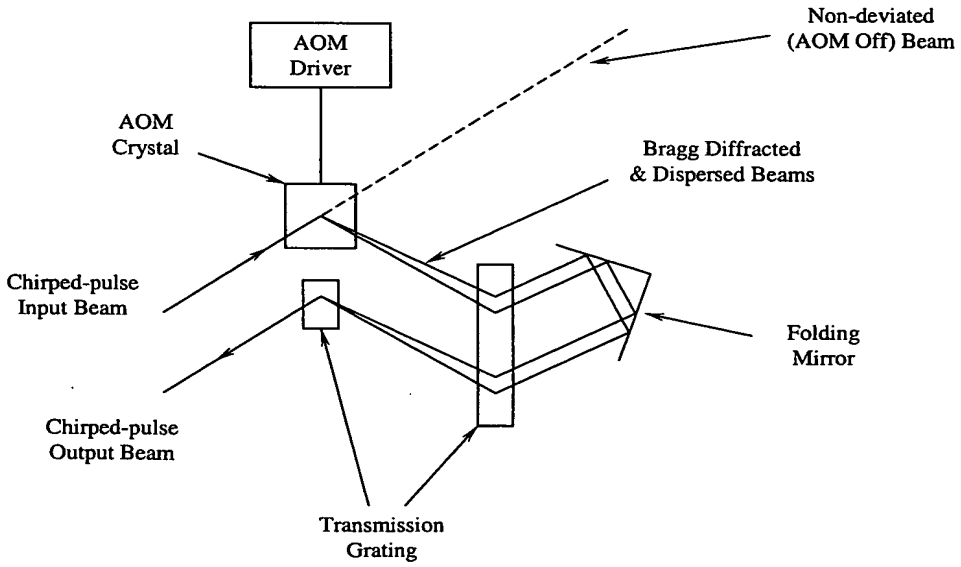


Fig. 19 - Lens-enhanced Two-pass Chirped-pulse Dispersion-compensated Acousto-optic Switch using Transmission Gratings

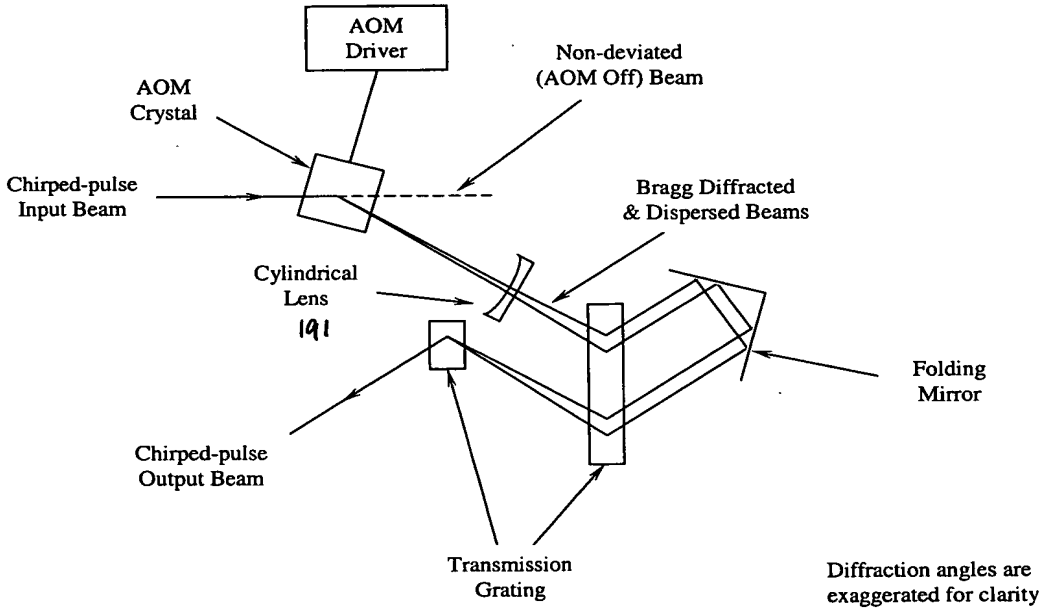


Fig. 20 - Lens-enhanced Four-pass Chirped-pulse Dispersion-compensated Acousto-optic Switch using a Reflection Gratin